W-band Resistive Mixer Integrated Circuit with Broadband Performance in 0.15 μm GaAs pHEMT Technologies

Wonseok Choe, Jisu Choi, Kyeongmok Ryu, and Jinho Jeong

Sogang University (Electronics Engineering), Seoul, Korea

Abstract

In this paper, *W*-band (75-110 GHz) resistive mixer is designed using 0.15 μm GaAs pseudo-morphic high electron mobility transistor (pHEMT) process. In order to achieve wideband performance, the transistor size and bias conditions are carefully determined so that the transistor presents around 50 Ω at IF. In addition, coupled-line RF filter with a ring-resonator is utilized to provide broadband RF matching and IF open circuit which also improves the bandwidth performance. The designed resistive mixer was fabricated and measured at *W*-band, which shows a good agreement with the simulations.

Keywords :
Resistive Mixer, MMIC Design, RFIC Design.

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